

CLAIMS

1. A lock mechanism for a valve having a valve body and a rotatable valve operating member projecting from the valve body, which mechanism comprises:
 - a driving member adapted for attachment to the operating member for
5 rotation therewith and formed with an arcuate outwardly-directed groove of part-circular cross-section, centred on the axis of the driving member;
 - a turning member mounted coaxially on the driving member and formed with an arcuate inwardly-directed groove of part-circular cross-section which groove is axially aligned with and opposed to the groove of the driving
10 member;
 - a plurality of balls each located partly in the two opposed grooves thereby to permit relative rotation between the driving member and the turning member while preventing relative axial movement; and
 - a key mechanism secured to the turning member and having a detent
15 selectively engageable by use of a key with the driving member to prevent relative rotation between the driving member and the turning member, the key mechanism including a portion in axial alignment with the opposed grooves which portion serves to retain the balls in the opposed grooves.
2. A lock mechanism as claimed in claim 1, wherein said groove in the
20 driving member is continuous and is encircled by the turning member.
3. A lock mechanism as claimed in claim 2, wherein said portion of the key mechanism blanks off the groove of the turning member, so as to retain said plurality of balls within the groove in the turning member.
4. A lock mechanism as claimed in claim 2, wherein said portion of the key

25 mechanism defines an arcuate channel in alignment with the arcuate groove in
the turning member, whereby balls are located in the aligned channel and
groove in the turning member as well as in the opposed groove in the driving
member.

5. A lock mechanism as claimed in claim 1, wherein there is a journal
30 formed between the driving member and the turning member at an axial
position spaced from the opposed grooves.

6. A lock mechanism as claimed in claim 5, wherein said journal is formed
by a low-friction ring interposed between the driving member and the turning
member and secured to one of the driving and turning members.

35 7. A lock mechanism as claimed in claim 6, wherein the ring is secured to
the end of the turning member furthest (in use) from the valve, which ring has a
bore which is a running fit on the driving member.

8. A lock mechanism as claimed in claim 1, wherein the turning member is
of generally cylindrical form and is provided with a window in the cylindrical side
40 wall thereof and there are side plates secured to the turning member, the key
mechanism being received in said window between the side plates.

9. A lock mechanism as claimed in claim 8, wherein security bolts are used
to attach the key mechanism to the side plates of the turning member.

10. A lock mechanism as claimed in claim 9, wherein said security bolts
45 comprise shear-headed bolts, which said bolts attach the key mechanism to the
side plates of the turning member.

11. A lock mechanism as claimed in claim 1, wherein said turning member is
provided with a skirt which is adapted partially to encircle the top-works of a
valve to which the lock mechanism is attached.

12. A lock mechanism as claimed in claim 1, wherein the key mechanism includes a cam which is turned by the insertion of a key into the mechanism and by the removal of the key from the key mechanism, the cam being engageable in a recess in the driving member to permit drive to be imparted thereto from the turning member.

13. A lock mechanism as claimed in claim 12, wherein said cam is engaged in a recess in the driving member when the key is fully inserted into the key mechanism.

14. A lock mechanism as claimed in claim 12, wherein a pawl is arranged to engage said cam and prevent the rotation thereof, other than when the key is fully inserted into the key mechanism.

15. A lock mechanism as claimed in claim 12, wherein the driving member has a cylindrical wall, and a plurality of recesses are formed in said cylindrical wall, the cam being receivable in any one of those recesses to permit drive to be imparted from the turning member to the driving member.

16. A lock mechanism as claimed in claim 1, wherein the turning member is provided with a hand-wheel by means of which the turning member can be rotated to operate a valve to which the mechanism is attached, once the key mechanism has been unlocked.

17. A valve and lock mechanism combination, the valve having a valve body and a rotatable valve operating member projecting from the valve body, and the lock mechanism comprises:

– a driving member attached to the operating member for rotation therewith and formed with an arcuate outwardly-directed groove of part-circular cross-section, centred on the axis of the driving member;

– a turning member mounted coaxially on the driving member and formed with an arcuate inwardly-directed groove of part-circular cross-section which groove is axially aligned with and opposed to the groove of the driving member;

5 – a plurality of balls each located partly in the two opposed grooves thereby to permit relative rotation between the driving member and the turning member while preventing relative axial movement; and

10 – a key mechanism secured to the turning member and having a detent selectively engageable by use of a key with the driving member to prevent relative rotation between the driving member and the turning member, the lock mechanism including a portion in axial alignment with the opposed grooves which portion serves to retain the balls in the opposed grooves.